

## Amendments to the Claims

1-8. (cancelled)

9. (currently amended) A method for producing or updating an inversely planned radiotherapy plan for fractionated radiation exposure of a patient, wherein an up-to-date radiotherapy plan is calculated using volume-dose histograms, the up-to-date radiotherapy plan being at least partly calculated on the basis of an already existing, approved, older plan for the same patient, the patient being subjected to an imaging method before each radiotherapy session over a duration of the fractionated radiation exposure, and wherein the calculation of the up-to-date radiotherapy plan is carried out using new image data created thereby, and The method as set forth in claim 1; wherein, for transferring a radiotherapy plan onto a more recent planning data set, the position and form of a target volume and the organs to be protected are fully or partly adopted fused automatically into the new plan from the old plan.

10. (cancelled)

11. (currently amended) The A method as set forth in claim 10, wherein the fusion involves a graphic elastic morphing method of the information to be fused.

12-15. (cancelled)

16. (new) A method for producing a session treatment plan for fractionated radiation exposure of a patient following production of an inversely planned radiotherapy treatment plan based on dosage distributions for a target volume and organ that have been previously approved by a physician or physicist, comprising the steps of:

(a) using a more current image data set of a target volume of a patient and an organ of the patient to be protected to update the positions of the target volume and organ in a previously acquired image data set to obtain an updated image data set;

- (b) using the previously approved dosage distributions to define constraints for volume-dosage histograms to be used to calculate a new session treatment plan for fractionated radiation exposure of the patient; and
- (c) calculating the new session treatment plan using the constraints and the updated image data set.

17. (new) A method as set forth in claim 16, comprising the step of (d) comparing the new session treatment plan with the previously approved treatment plan obtained using the previously approved dosage distributions to determine if the deviations fall within specified tolerance range.

18. (new) A method as set forth in claim 17, comprising the step of (e) carrying out the new session treatment plan if the deviations fall within the pre-defined tolerance range without re-evaluation and approval of the new session treatment plan by a physician or physicist.

19. (new) A method as set forth in claim 18, wherein the new session treatment plan is automatically qualified as an approved plan if the deviations fall within the pre-defined tolerance range.

20. (new) A method as set forth in claim 19, wherein steps (a) through (e) are repeated during multiple fractionated radiotherapy treatment sessions.

21. (new) A method as set forth in claim 18, wherein steps (a) through (e) are repeated during multiple fractionated radiotherapy treatment sessions.

22. (new) A method as set forth in claim 18, wherein the patient is subjected to an imaging method before each fractionated radiotherapy treatment session to obtain a current image data set for each respective session.

23. (new) A method as set forth in claim 16, comprising the step of acquiring the current image data set of the target volume and the organ by subjecting the patient to an imaging method.

24. (new) A method as set forth in claim 23, wherein the position of the patient relative to the imaging device is detected by the use of locating markers outside the region of the patient being imaged by the imaging device.

25. (new) A method as set forth in claim 24, wherein the system for locating the markers is calibrated relative to the imaging device, such that the position of the markers can be determined relative to a data set recorded by the imaging device.

26. (new) A method as set forth in claim 16, wherein automatic fusion is used to update the positions of the target volume and organ in the previously acquired image data set to obtain an updated image data set.

27. (new) A method as set forth in claim 26, wherein the imaging method is a CT or MR image recording method.

28. (new) A method as set forth in claim 16, wherein the position and form of the target volume and organ are fully or partly adopted automatically into the updated image data set.

29. (new) A method as set forth in claim 28, wherein the adopted information is transferred by means of a three-dimensional fusion of the contours, drawn in by hand, onto layers or voxels of the updated image data set.

30. (new) A method as set forth in claim 29, wherein the fusion is effected by a graphic elastic morphing method.

31. (new) A computer programmed to perform a method for producing a session treatment plan for fractionated radiation exposure of a patient following

production of an inversely planned radiotherapy treatment plan based on dosage distributions for a target volume and organ that have been previously approved by a physician or physicist, comprising the steps of:

- (a) using a more current image data set of a target volume of a patient and an organ of the patient to be protected to update the positions of the target volume and organ in a previously acquired image data set to obtain an updated image data set;
- (b) using the previously approved dosage distributions to define constraints for volume-dosage histograms to be used to calculate a new session treatment plan for fractionated radiation exposure of the patient; and
- (c) calculating the new session treatment plan using the constraints and the updated image data set.

32. (new) A computer program storage medium comprising a program which, when running on a computer, performs a method for producing a session treatment plan for fractionated radiation exposure of a patient following production of an inversely planned radiotherapy treatment plan based on dosage distributions for a target volume and organ that have been previously approved by a physician or physicist, comprising the steps of:

- (a) using a more current image data set of a target volume of a patient and an organ of the patient to be protected to update the positions of the target volume and organ in a previously acquired image data set to obtain an updated image data set;
- (b) using the previously approved dosage distributions to define constraints for volume-dosage histograms to be used to calculate a new session treatment plan for fractionated radiation exposure of the patient; and
- (c) calculating the new session treatment plan using the constraints and the updated image data set.